AR-ES6050FLD-W
User Manual

Revision	Description	Date
1.0	Release	2012/4/6

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1 Introduction to AR-ES6050FLD-W

AR-ES6050FLD-W is a fan-less embedded system that could be used by DIN mount for factory uses, VESA mount for medical/multimedia display and wall mount for automatic control. It is designed with Intel Atom N450 and supports up to 2GB of DDR2 memory.

AR-ES6050FLD-W has diverse physical interface for different peripheral, e.g. VGA port, LVDS pin header, 4 *USB 2.0 ports, 1 *USB 2.0 pin header, 2 *COM pin header, 2 *GBbps ports, 2 *SATA ports, CF type I/II slot and Realtek audio output port. It is also equipped with industrial standard PCI-104 and mini-PCIe interface. Users can purchase suitable add-on cards to satisfy their needs.

1.1 Specifications

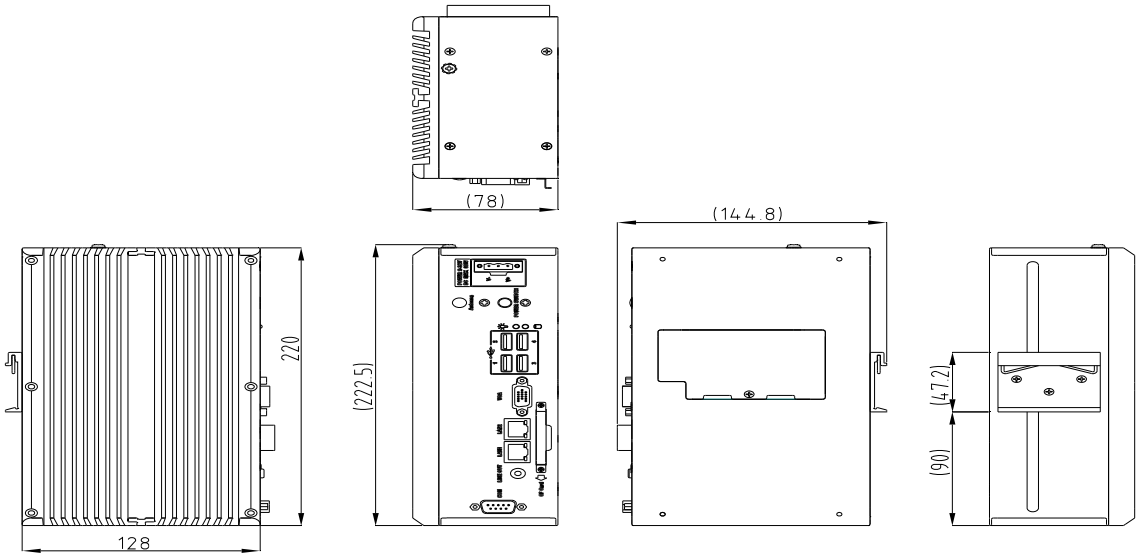
Item	Description
System	AR-ES6050FLD-W
CPU Board	AR-B6050
System Dimensions	220*128*78(mm)

1.2 Packing List

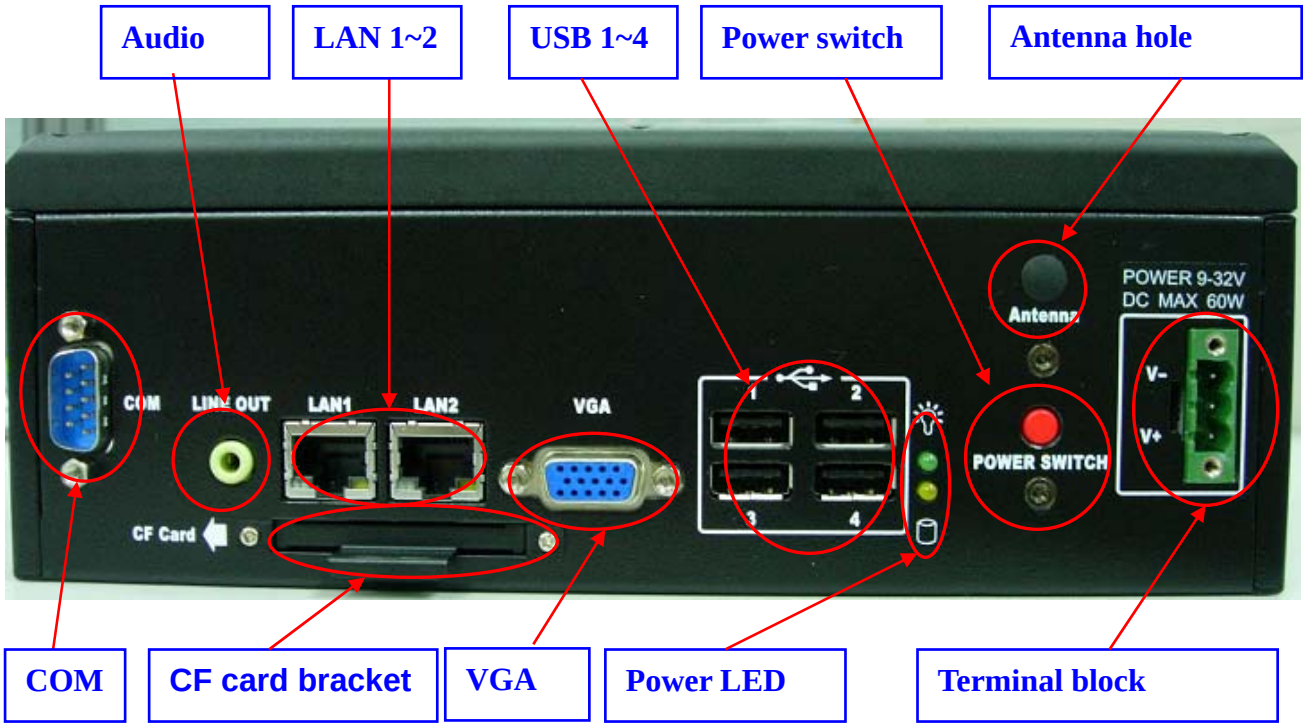
Description	Quantity	Remark
AR-ES6050FLD-W	1	
1GB DDR2 SDRAM	1	
Quick User Guide	1	
Utility CD	1	
DIN mounting bracket	1	

1.3 System Dissection

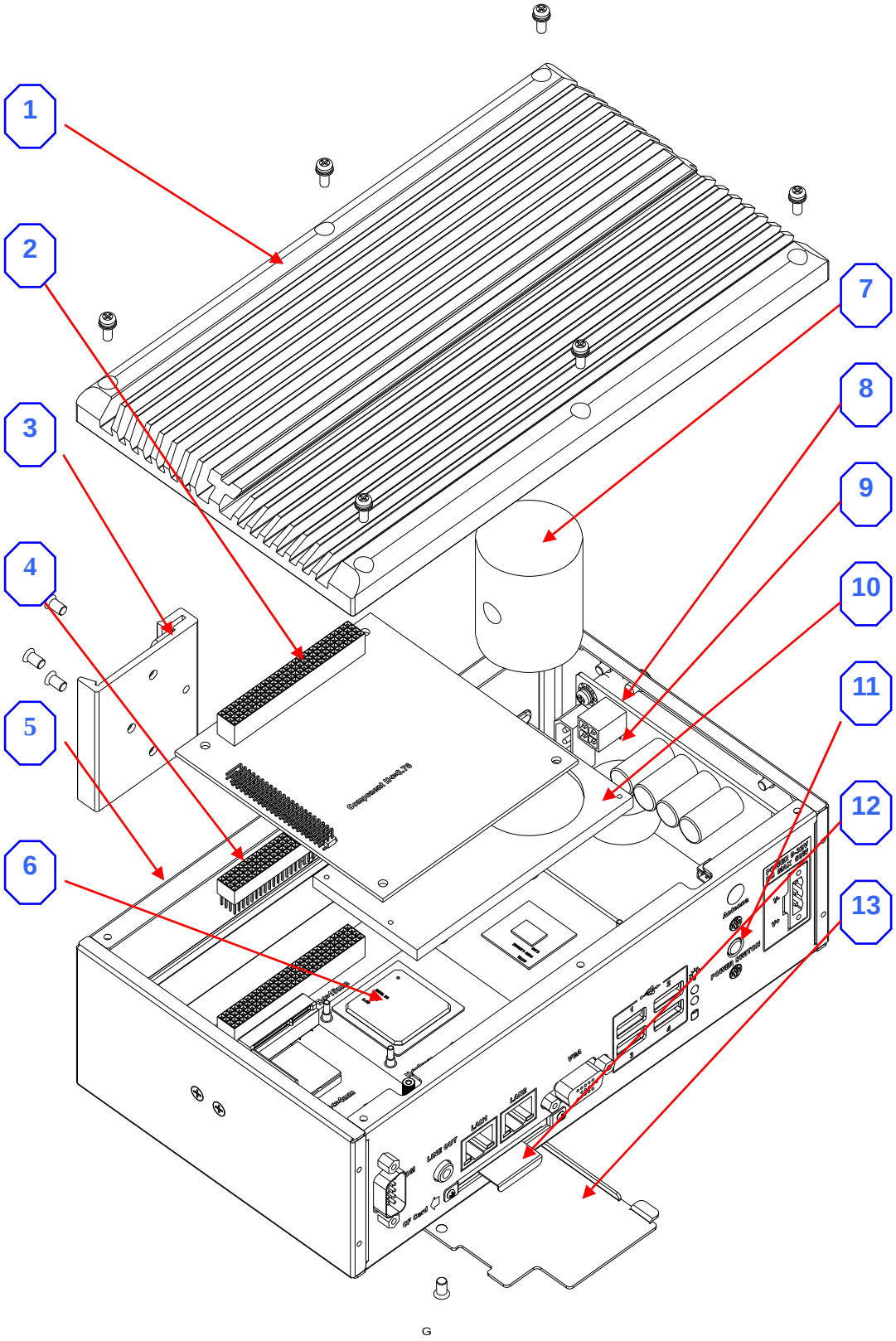
(1) Dimensions



(2)Front Panel



(3)System Configuration



Item	Description	Quantity
1	LEFT COVER	1
2	PCI-104 CARD	1
3	DIN MOUNTING BRACKET	1
4	PCI-104 TAIL CONNECTOR	1
5	BASE	1
6	AR-B6050	1
7	HEAT COLUMN	1
8	POWER BOARD BRACKET	1
9	AR-PW0932TB	1
10	HEAT PLATE	1
11	SWITCH BUTTON	1
12	CF CARD BRACKET	1
13	BASE DDR DOOR	1

2 Procedures of Assembly/Disassembly

2.1 Installing the CF card

1. Unfasten two screws of CF bracket and then take out the CF card bracket.

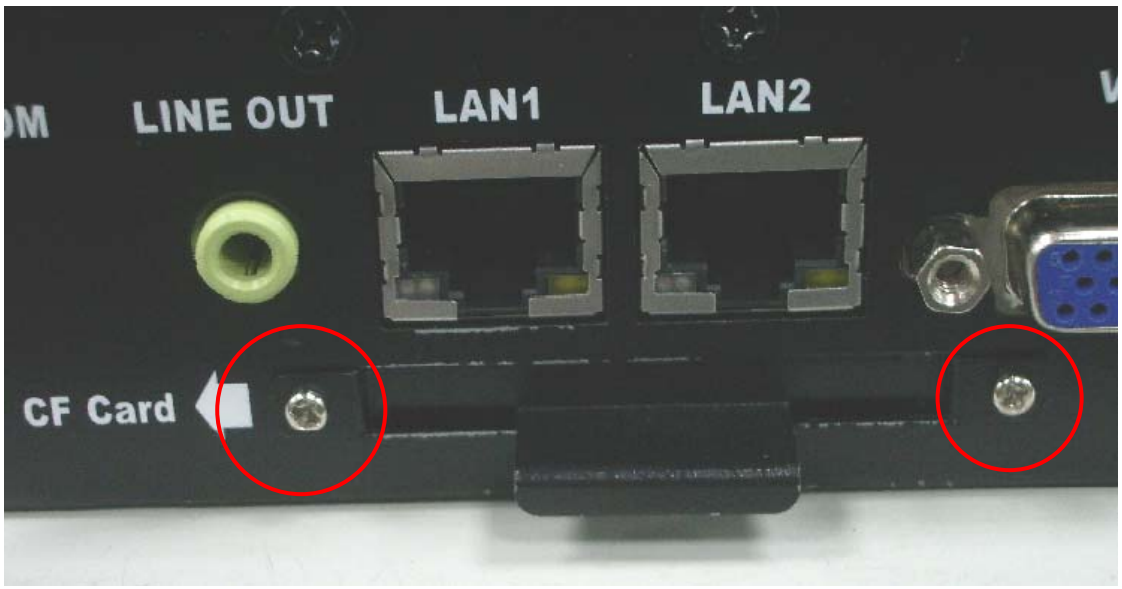


Figure 1

2. Put the CF card into CF bracket (figure 2).
   Please note that the direction of CF card and CF bracket (figure 3).

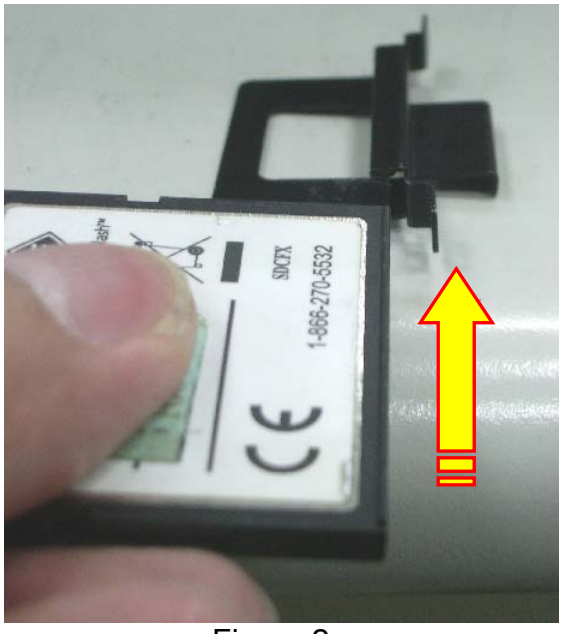


Figure 2

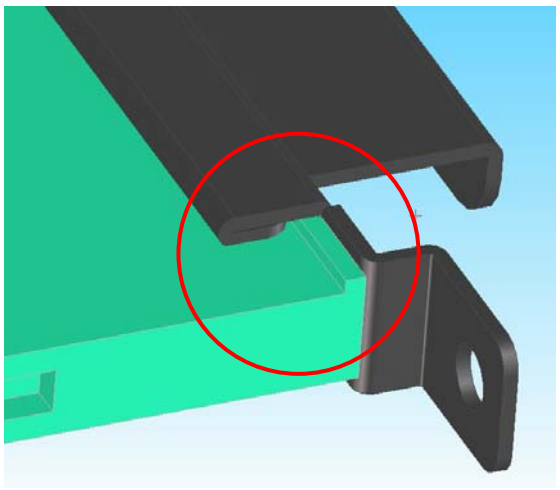


figure 3

3. Push CF card to the bottom of bracket to stop the forwarding at the bend of bracket.

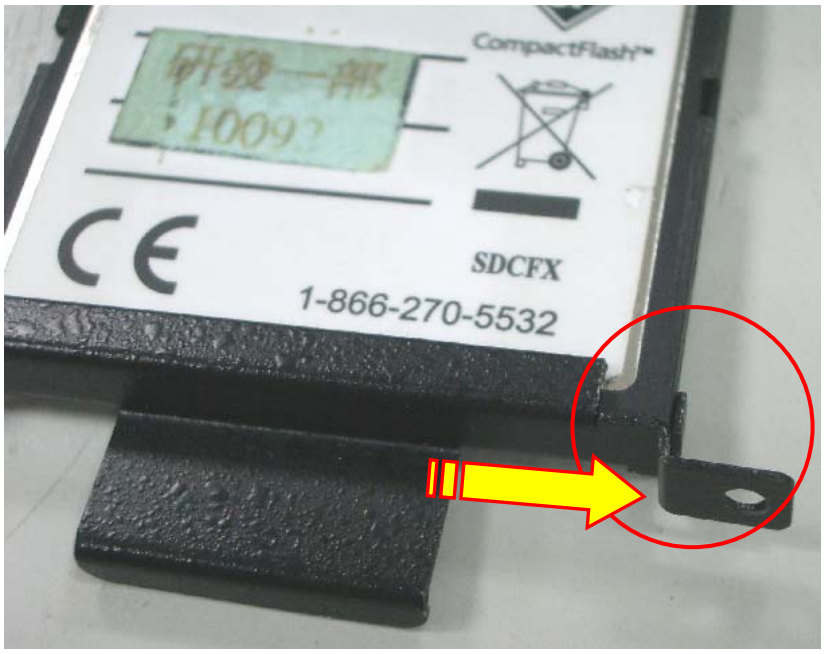


Figure 4

4. Push them into the CF slot of system machine and then fasten the two original screws to fix CF bracket.

Figure 5

2.2 Installing the Mini PCI-e interface card

1. Unfasten the six screws to take out the heat sink cover.

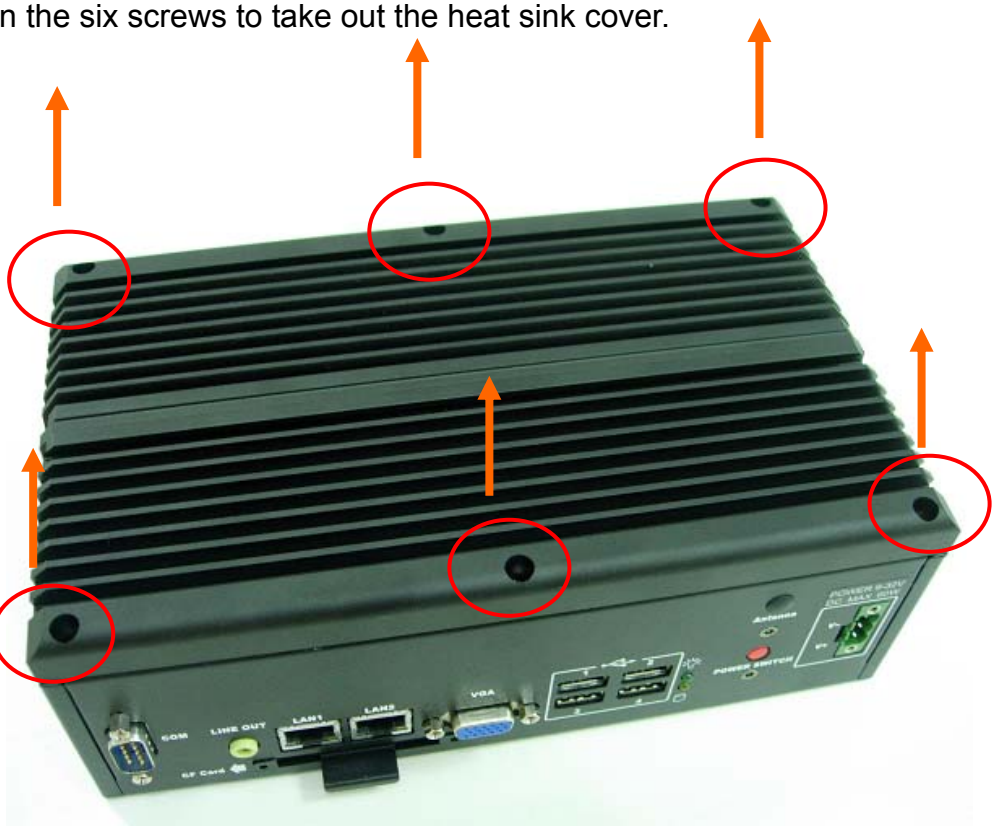


Figure 6

2. Maybe you need to force open the heat sink cover.

Figure 7

3. Align the notch key on the Mini PCI-e card with rib on the slot.

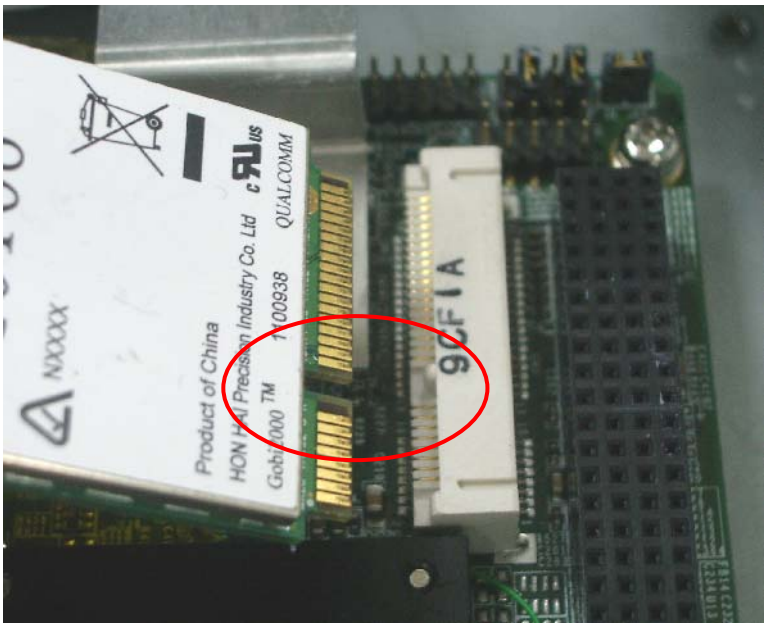


Figure 8

4. Push Mini PCI-e card horizontally

.

Figure 9

5. Using two M2 screws to fasten Mini PCI-e card.

Figure 10

6. Close the heat sink cover using the original screws to fasten heat sink cover and base. (Please refer to figure 6)

2.3 Installing the DDR2 SO-DIMM procedures

1. Unfasten the screw of the DDR cover and open the cover.

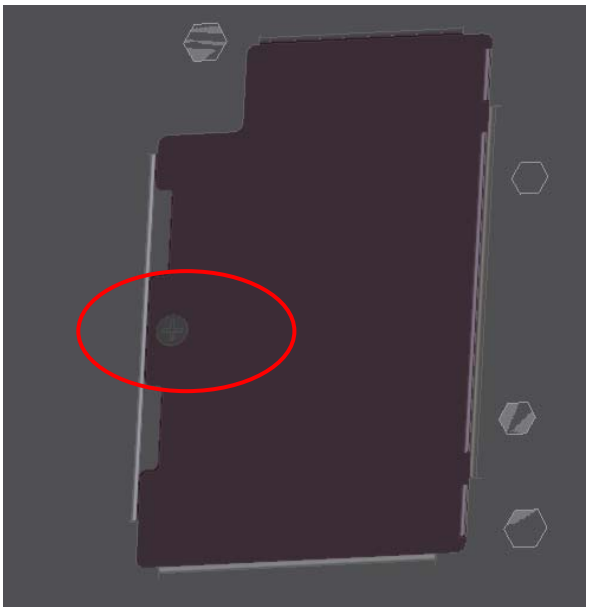


Figure 11

2. Align the notch key on DDR2 SO-DIMM with rib on the DDR2 socket.

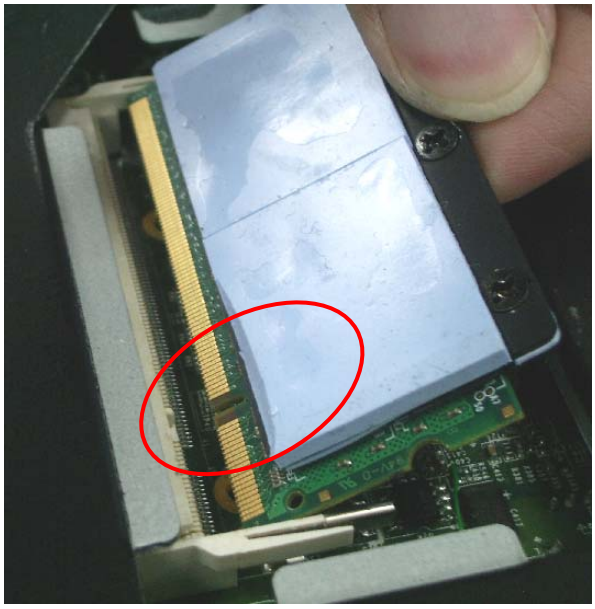


Figure 12

3. Push DDR2 SO-DIMM horizontally and make sure it is locked by hooks of two sides of DDR2 socket.

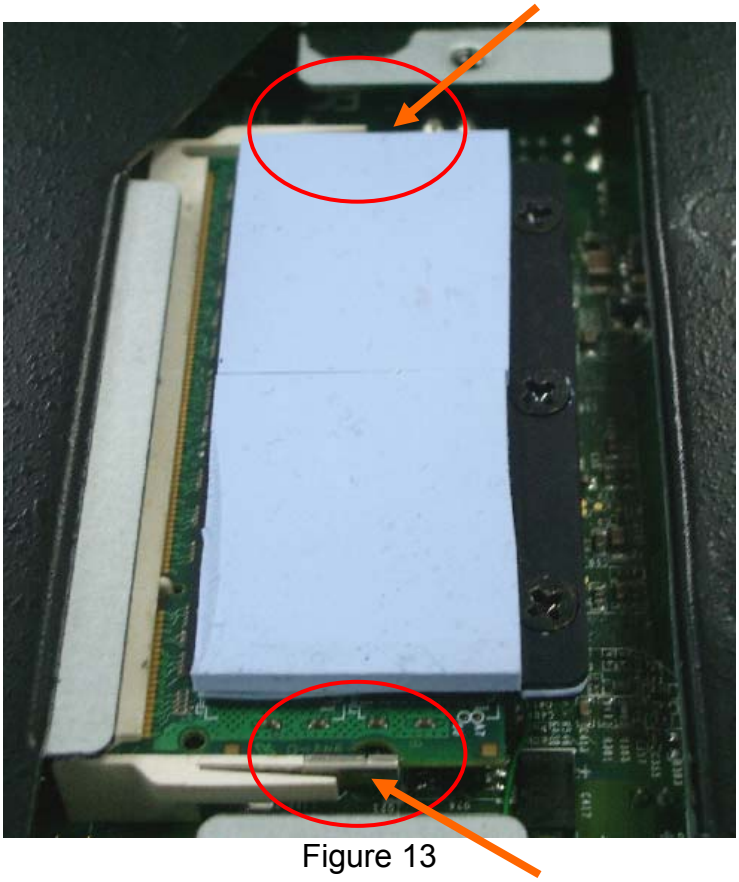


Figure 13

4. Recover the DDR cover and fasten it with the screw.

.

2.4 Assemble/Disassemble the DIN mounting bracket.

1. Hook the spring of the DIN mounting bracket onto the upper of DIN rail.

Figure 14

2. Press down the AR-ES6050FLD-W system machine and push it forward lightly.

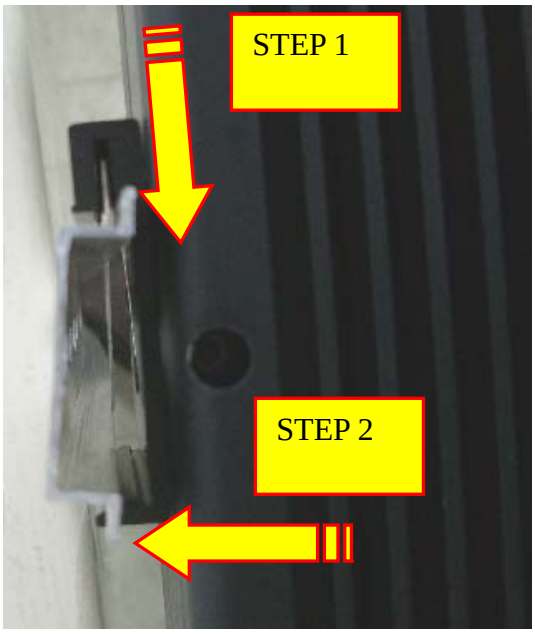


Figure 15

3. Make sure they are locked together.

Figure 16

4. Disassemble the DIN mounting bracket of AR-ES6050FLD-W system. Press down the AR-ES6050FLD-W system machine and pull it back lightly.

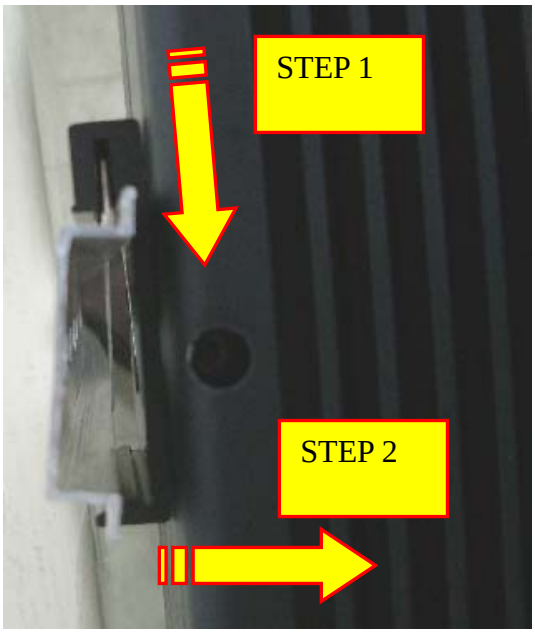
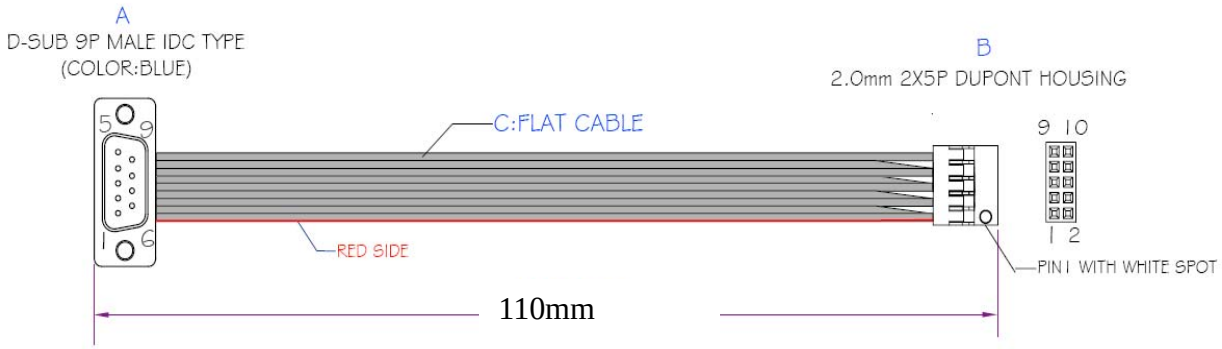


Figure17

Appendix. Cable Pin Define

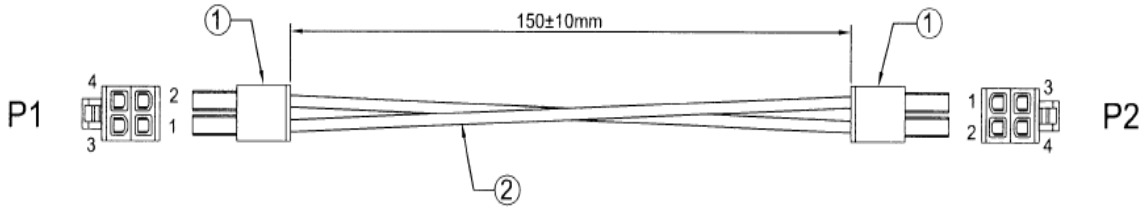
1. Com cable



PIN DEFINE:

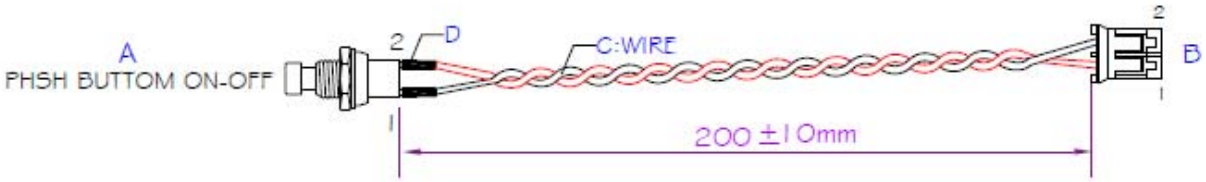
A	1	2	3	4	5	6	7	8	9
B	1	3	5	7	9	2	4	6	8
COLOR	RED	GRAY	GRAY	GRAY	GRAY	GRAY	GRAY	GRAY	GRAY

2. Power Cable



COLOR	P1	P2
BLACK	1	1
BLACK	2	2
YELLOW	3	3
YELLOW	4	4

3. Switch Cable

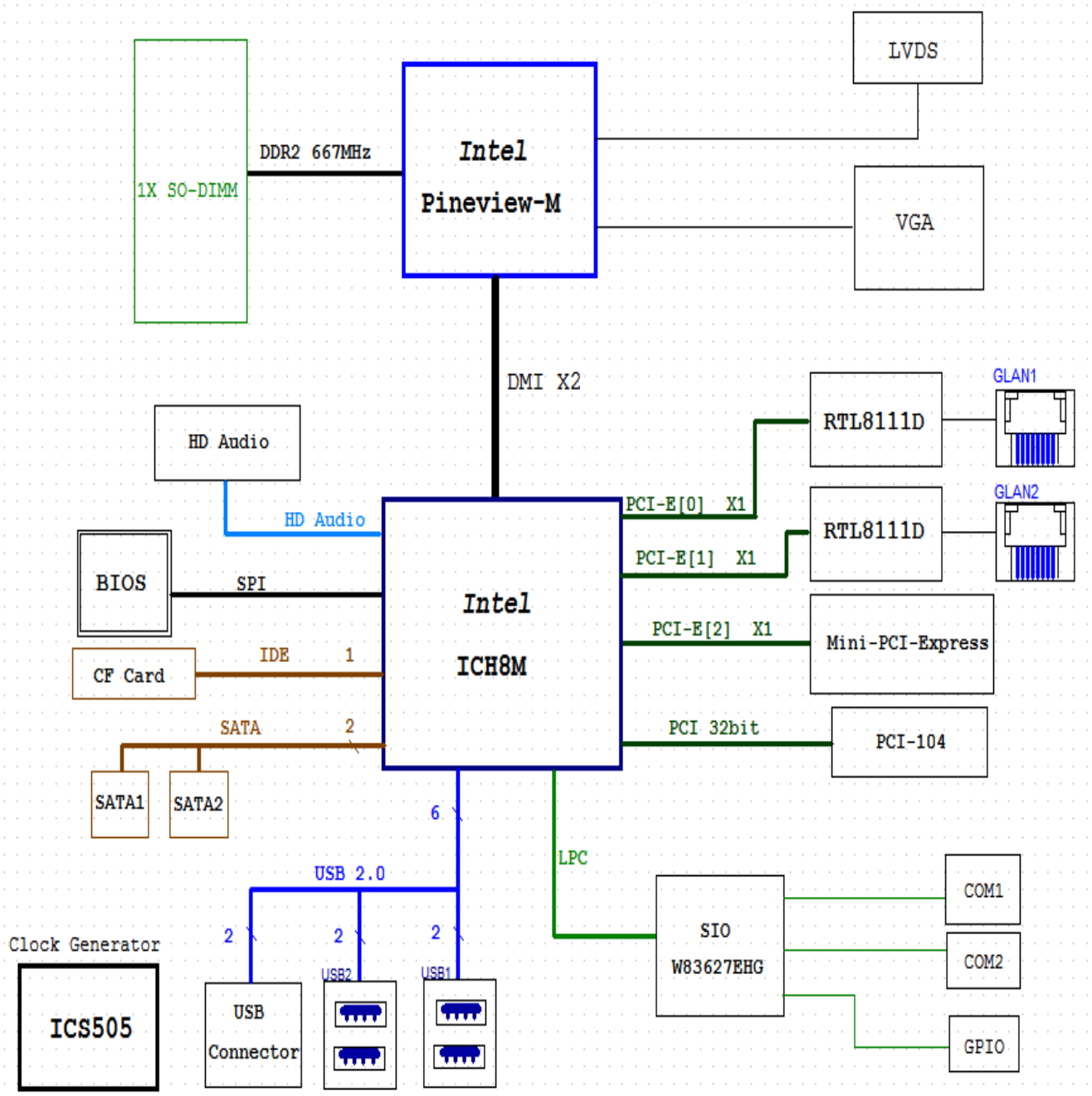


PIN DEFINE:

A	1	2
B	2	1
COLOR	BLACK	RED
WIRE	UL1007 26AWG	UL1007 26AWG

3 AR-B6050 Board Guide

3.1 Block Diagram



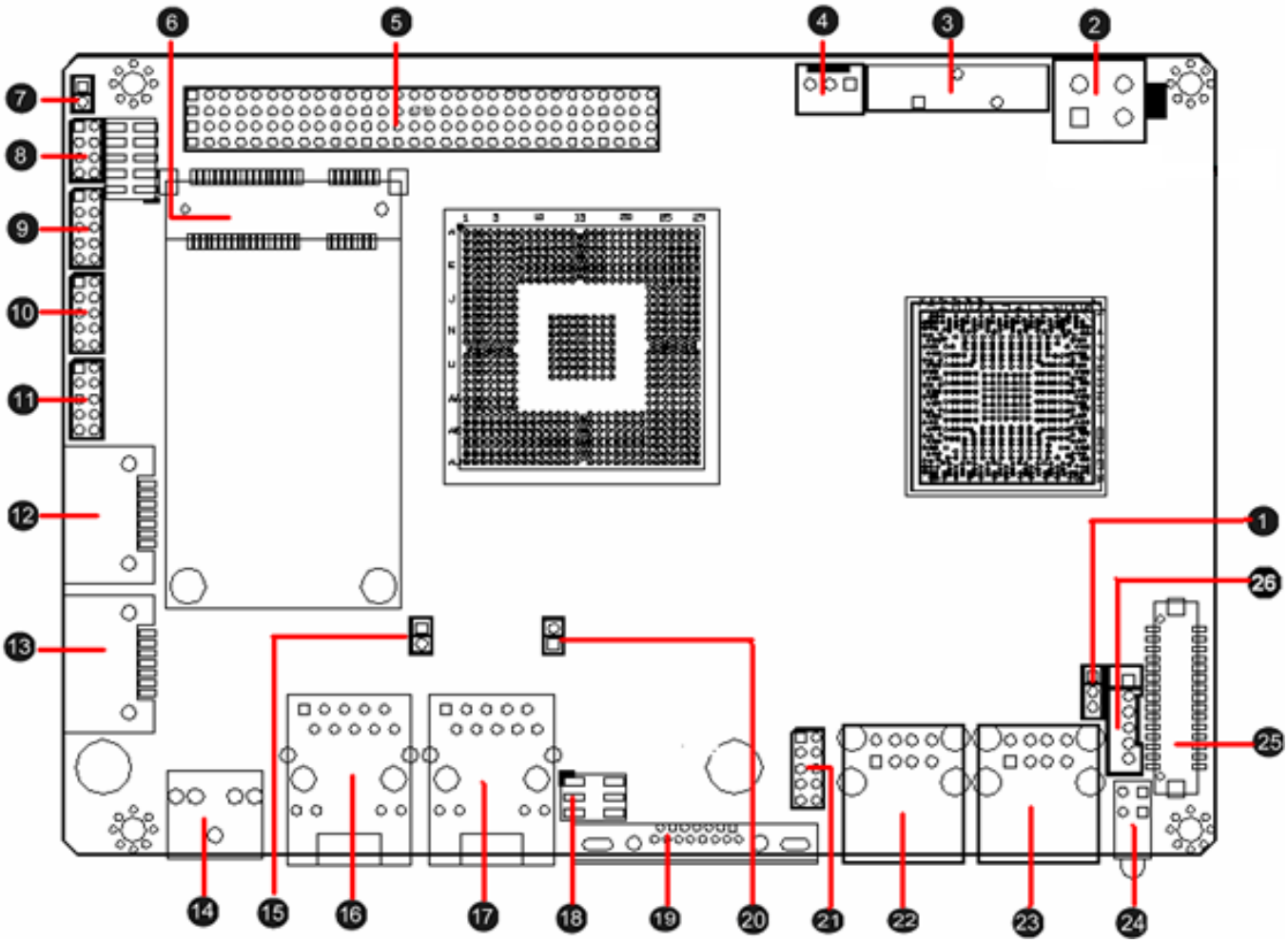
AR-B6050 Board Specifications

- Intel Atom N450 1.66GHz
- Intel Graphics Media Accelerator 950
- 1 x SO-DIMM supports DDRII up to 2GB(Memory DDR2 data transfer rates of 667 MT/s)
- 1 x VGA
- 4 x USB2.0
- 2 x SATA
- 1 x CF II
- 2 x RS-232
- 2 x GbE (Realtek RTL8111D)
- 1 x PCI-104 & 1 x Mini-PCIe
- 8-bit GPIO

3.2 AR-B6050 H/W Information

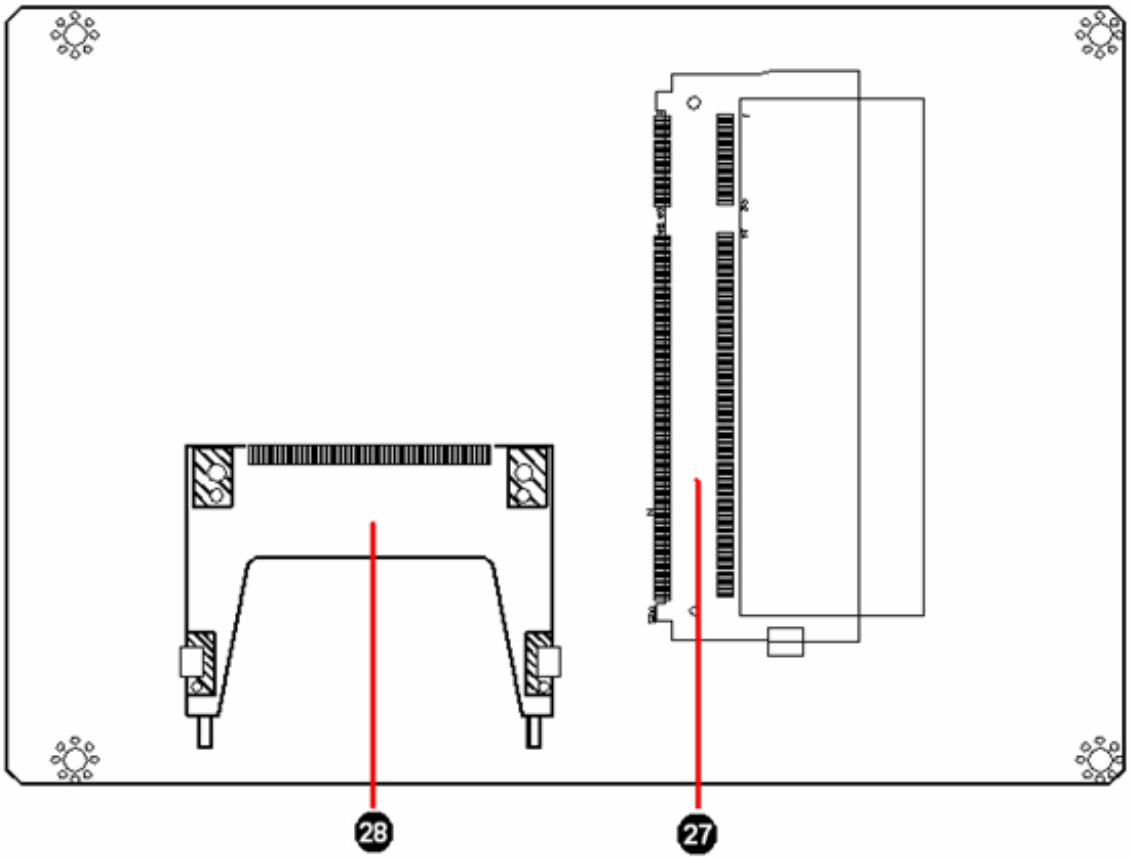
This section describes the installation of AR-B6050. At first, it shows the Function diagram and the layout of AR-B6050. It then describes the unpacking information which you should read carefully, as well as the jumper/switch settings for the AR-B6050 configuration.

3.2.1 AR-B6050 LAYOUT (Top side)



1	JP1	10	COM1	19	VGA1
2	ATX1	11	COM2	20	J1
3	BAT1	12	SATA2	21	USB3
4	SYSFAN1	13	SATA1	22	USB1
5	CN2	14	CN4	23	USB2
6	CN3	15	JP3	24	LED1
7	JP2	16	LAN1	25	LVDS1
8	J7	17	LAN2	26	CN1
9	GPIO1	18	J6		

3.2.2 AR-B6050 LAYOUT (Bottom side)



27	SODIMM1
28	CF

3.3 Components and Jumps Setting List

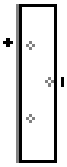
1. JP1: LCD panel driving voltage selection.

STATUS	SETTING
1-2	+3.3V (Default).
2-3	+5V

2. ATX1: AT power input connector.

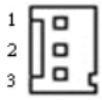
PIN	SETTING
1	GND
2	GND
3	+12V
4	+12V

3. BAT1: CMOS battery holder.



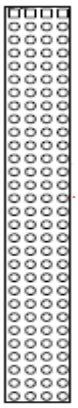
CMOS battery holder.

4. SYSFAN1: System DC Fan connector.



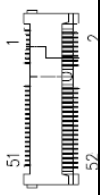
PIN	SETTING
1	GND
2	+12V
3	Fan speed data

5. CN2: PCI-104 connector.



PCI-104 connector.

6. CN3: MINI PCI-E connector.



MINI PCI-E connector.

7. JP2: Signal SERIRQ connects to PCI-104 pin #B1 selection.

STATUS	SETTING
Open	Disconnected. (Default)
Short	Connected.

8. J7: COM1/2 SELECT RI OR +12V

PIN	SIGNAL	PIN	SIGNAL
1	RI#1	2	RI#1_12V
3	+12V	4	RI#1_12V
5	RI#2	6	RI#2_12V
7	+12V	8	RI#2_12V

9. GPIO1: GPIO connector.

PIN	SETTING	PIN	SETTING
1	GPIO0	2	+5V
3	GPIO1	4	GPIO7
5	GPIO2	6	GPIO6
7	GPIO3	8	GPIO5
9	GND	10	GPIO4

10. COM1: RS232 signal connector for port #1.

PIN	SETTING	PIN	SETTING
1	DCD #1	2	DSR #1
3	RX #1	4	RTS #1
5	TX #1	6	CTS #1
7	DTR #1	8	RI #1
9	GND	10	GND

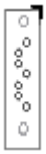
11. COM2: RS232 signal connector for port #2.

PIN	SETTING	PIN	SETTING
1	DCD #2	2	DSR #2
3	RX #2	4	RTS #2
5	TX #2	6	CTS #2
7	DTR #2	8	RI #2
9	GND	10	GND

12. SATA1: SATA device connector #1.

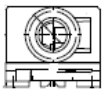
SATA device connector #1.

13. SATA2: SATA device connector #2.



SATA device connector #2.

14. CN4: Audio signal connector.



Audio line out

15. JP3: CF MASTER SELECT

SET	SIGNAL
SHORT	MASTER
OPEN	SLAVE

16. LAN1: RJ45 connector for Gigabit Ethernet port #1.

RJ45 connector for Gigabit Ethern*et* port #1.

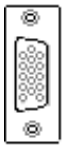
17. LAN2: RJ45 connector for Gigabit Ethernet port #2.

RJ45 connector for Gigabit Ethern*et* port #2.

18. J6: Front panel connector.

STATUS	SETTING
1-2	Hardware reset
3-4	AT Mode - Short ATX Mode - Open
5-6	Power Button

19. VGA1: D-SUB-15 female connector for VGA output.



D-SUB-15 female connector for VGA output.

20. J1: CMOS data clear

SHORT CMOS data clear

21. USB3: Internal USB2.0 connector

PIN	SETTING	PIN	SETTING
1	+5V	2	+5V
3	USB5-	4	USB6-
5	USB5+	6	USB6+
7	GND	8	GND
9	GND	10	GND

22. USB1: USB connector

Upper: Port #2.
Lower: Port #1.

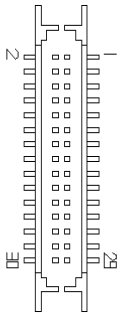
23. USB2: USB connector

Upper: Port #4.
Lower: Port #3.

24. LED1: System power and HDD access indicators.

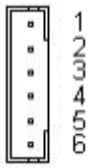
Green: System power indicator.
Yellow: HDD access indicator.

25. LVDS1: LCD panel inverter power connector.

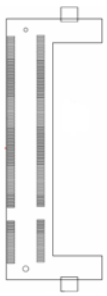


PIN	SETTING	PIN	SETTING
1	LCD VDD	2	GND
3	NC	4	NC
5	GND	6	NC
7	NC	8	GND
9	NC	10	NC
11	NC	12	NC
13	NC	14	NC
15	GND	16	O CLK+
17	CLK-	18	GND
19	Data2+	20	Data2-
21	I2C CLK	22	Data1+
23	Data1-	24	I2C Data
25	Data0+	26	Data0-
27	NC	28	NC
29	LCD VDD	30	LCD VDD

26. CN1: LCD panel inverter power connector.



PIN	SETTING
1	+12V
2	+12V
3	GND
4	BKL ON
5	GND
6	Reserved.

27. DIMM1: DDR-II SODIMM Socket.		28. CF1: Type-II compact flash card socket.		
	**DDR-II SODIMM Socket.**		**+3.3V CF card only and UDMA mode supported.**	

3.4 BIOS Setting

The BIOS Setup Utility is a hardware configuration program built into your computer's BIOS.

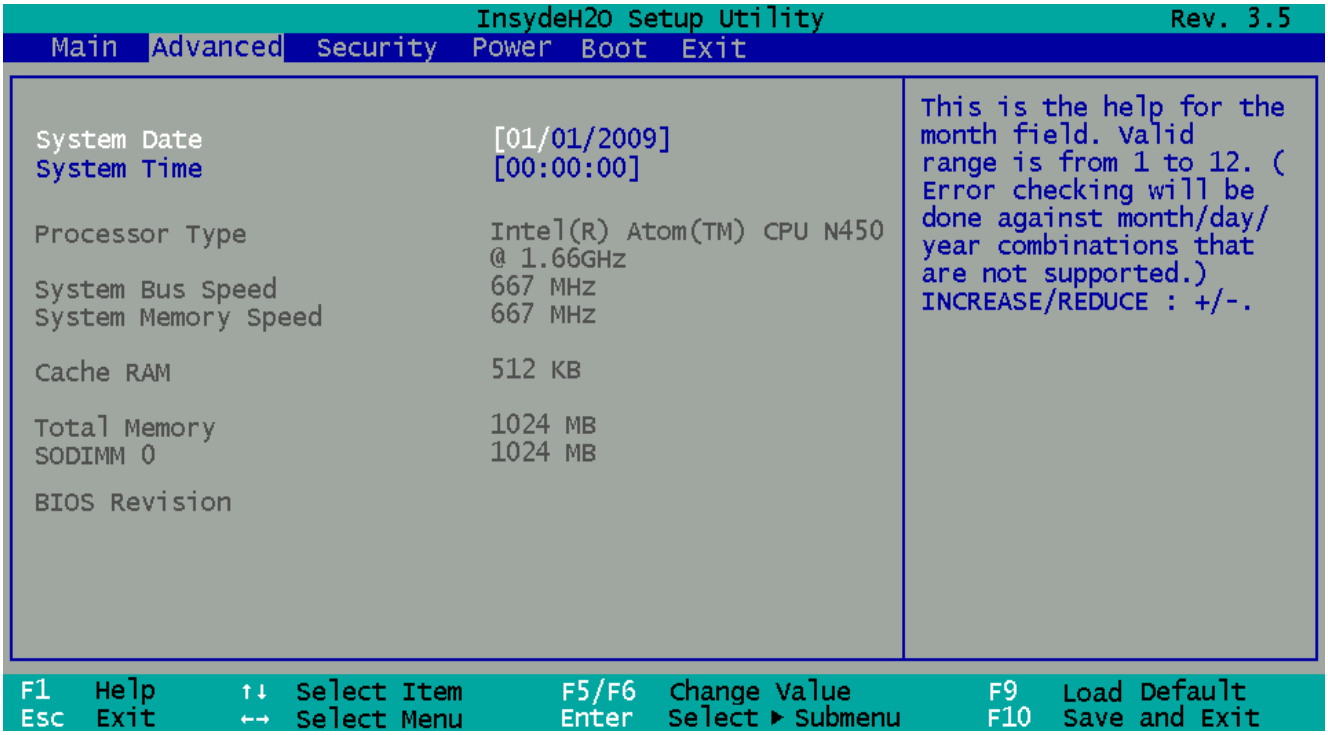
To activate the BIOS Utility, press F2 during POST (when "Press <F2> to enter Setup" message is prompted on the bottom of screen). Press <F12> during POST to enter multi-boot menu. In this menu, user can change boot device without entering BIOS SETUP Utility.

This chapter describes the BIOS menu displays and explains how to perform common tasks needed to get the system up and running. It also gives detailed explanation of the elements found in each of the BIOS menu. The following topics are covered:

- Main Setup
- Advanced Setup
- Security Setup
- Boot Setup
- Exit Setup

3.4.1 Main Setup

Once you enter the InsydeH2O BIOS™ Setup Utility, the Main Menu will appear on the screen. Use the arrow keys to highlight the item and then use the <F5> <F6> keys to select the desired value in each item.

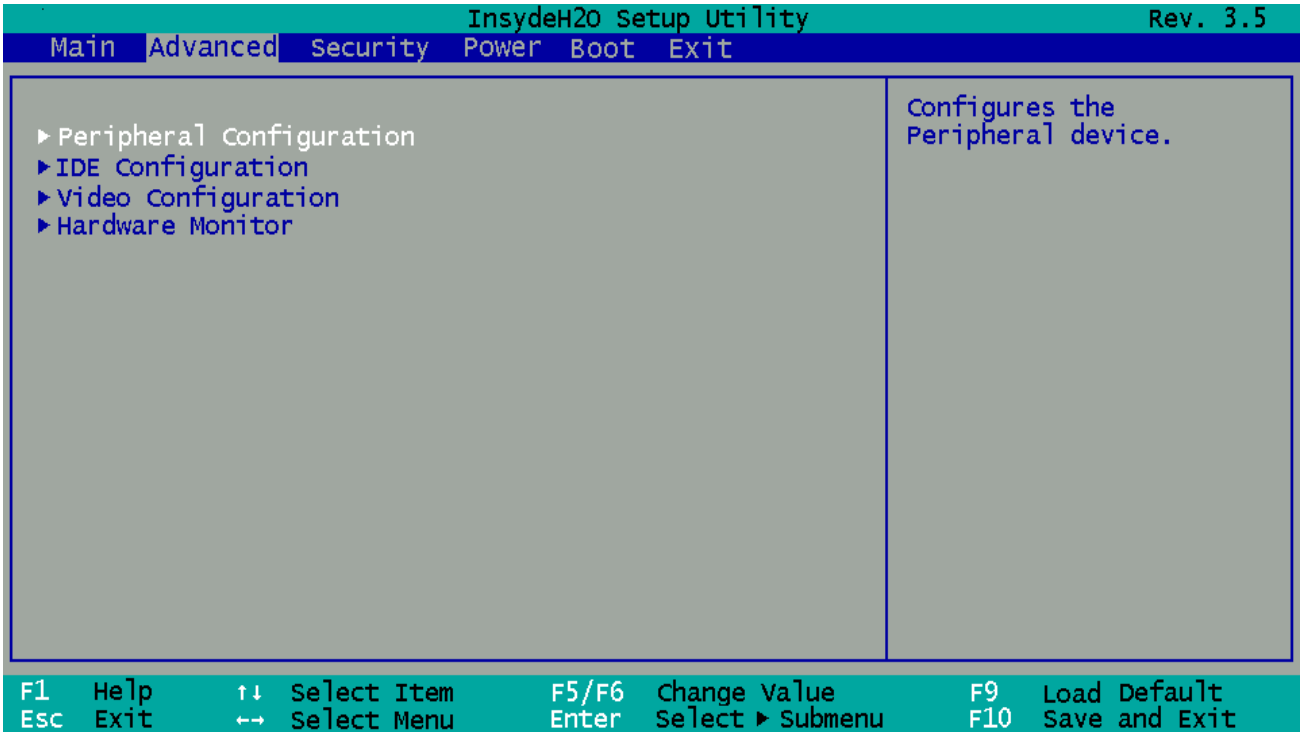

InsydeH2O Setup Utility Rev. 3.5
Main Advanced Security Power Boot Exit
System Date [01/01/2009]
System Time [00:00:00]
Processor Type Intel(R) Atom(TM) CPU N450 @ 1.66GHz
System Bus Speed 667 MHz
System Memory Speed 667 MHz
Cache RAM 512 KB
Total Memory 1024 MB
SODIMM 0 1024 MB
BIOS Revision
This is the help for the month field. Valid range is from 1 to 12. (Error checking will be done against month/day/ year combinations that are not supported.) INCREASE/REDUCE : +/-.
F1 Help ↑↓ Select Item F5/F6 Change Value F9 Load Default
Esc Exit ←→ Select Menu Enter Select ▸ Submenu F10 Save and Exit

Note: The control keys are listed at the bottom of the menu. If you need any help with the item fields, you can press the <F1> key, and the relevant information will be displayed.

Item	Option	Description
System Date	Format : MM/DD/YYYY (month/day/year)	Set the system date. Note that the 'Day' automatically changes when you set the date.
System Time	Format: HH:MM:SS (hour:minute:second)	Set the system time.
Processor Type	N/A	This field shows the CPU type and speed of the system.
System Bus Speed	N/A	This field displays the bus speed of the system.
System Memory Speed	N/A	This field displays the real speed of the memory.

Cache RAM	N/A	This field displays the cache ram of the CPU.
Total Memory	N/A	Displays the total memory available.
SODIMM 0	N/A	This field displays the memory of the SODIMM0.
BIOS Revision	N/A	Displays system BIOS version.

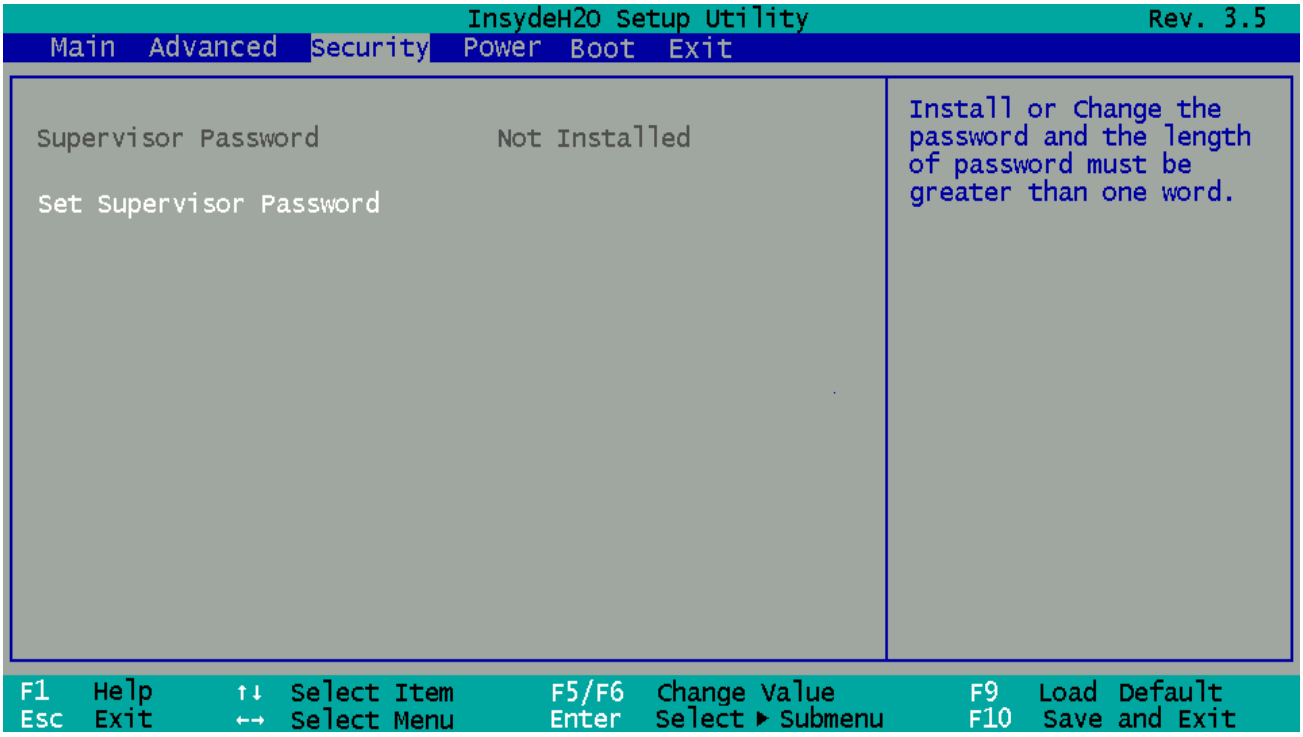
3.4.2 Advanced Chipset Setup


InsydeH2O Setup Utility Rev. 3.5
Main Advanced Security Power Boot Exit
Peripheral Configuration
IDE Configuration
Video Configuration
Hardware Monitor
Configures the Peripheral device.
F1 Help ↑↓ Select Item F5/F6 Change Value F9 Load Default
Esc Exit ↔ Select Menu Enter Select ▸ Submenu F10 Save and Exit

Note: The control keys are listed at the bottom of the menu. If you need any help with the item fields, you can press the <F1> key, and the relevant information will be displayed.

Item	Option	Description
Peripheral Configuration	Serial Port A Serial Port B Azalia Audio control	Enter the Peripheral Configuration menu.
IDE Configuration	IDE Controller HDC Configure as	Enter the IDE Configuration menu.
Video Configuration	Init Display First IGD-Device2, Function1 IGD-Frame Buffer Size IGD-DVMT Size IGD-Boot Type IGD-LCD Panel type	Enter the Video Configuration menu.
Hardware Monitor	N/A	This field displays the Hardware Monitor of the system.

3.4.3 Security Setup


InsydeH2O Setup Utility Rev. 3.5
Main Advanced Security Power Boot Exit
Supervisor Password Not Installed
Set Supervisor Password
Install or Change the password and the length of password must be greater than one word.
F1 Help ↑↓ Select Item F5/F6 Change Value F9 Load Default
Esc Exit ↔ Select Menu Enter Select ▸ Submenu F10 Save and Exit

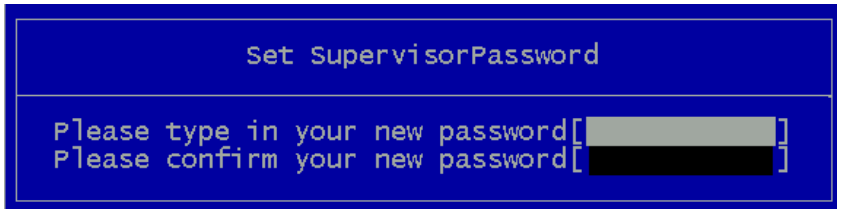
Note: The control keys are listed at the bottom of the menu. If you need any help with the item fields, you can press the <F1> key, and the relevant information will be displayed.

Item	Option	Description
Supervisor Password	Not Installed Installed	Shows the setting of the Supervisor password
Set Supervisor Password	N/A	Press Enter to set the user password. When user password is set, this password protects the BIOS Setup Utility from unauthorized access. The user can enter Setup menu only and does not have right to change the value of parameters.

Setting a Password

Follow these steps as you set the user or the supervisor password:

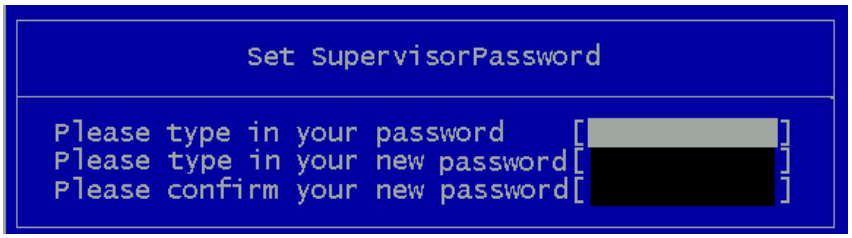
1. Use the ↑ and ↓ keys to highlight the Set Supervisor Password parameter and press the Enter key. The Set Supervisor Password box appears:



2. Type a password in the “Enter New Password” field. The password length can not exceed 8 alphanumeric characters (A-Z, a-z, 0-9, not case sensitive). Retype the password in the “Confirm New Password” field.
IMPORTANT: Be very careful when typing your password because the characters do not appear on the screen.
3. Press Enter. After setting the password, the computer sets the User Password parameter to “Set”.
4. If desired, you can opt to enable the Password on boot parameter.
5. When you are done, press F10 to save the changes and exit the BIOS Setup Utility.

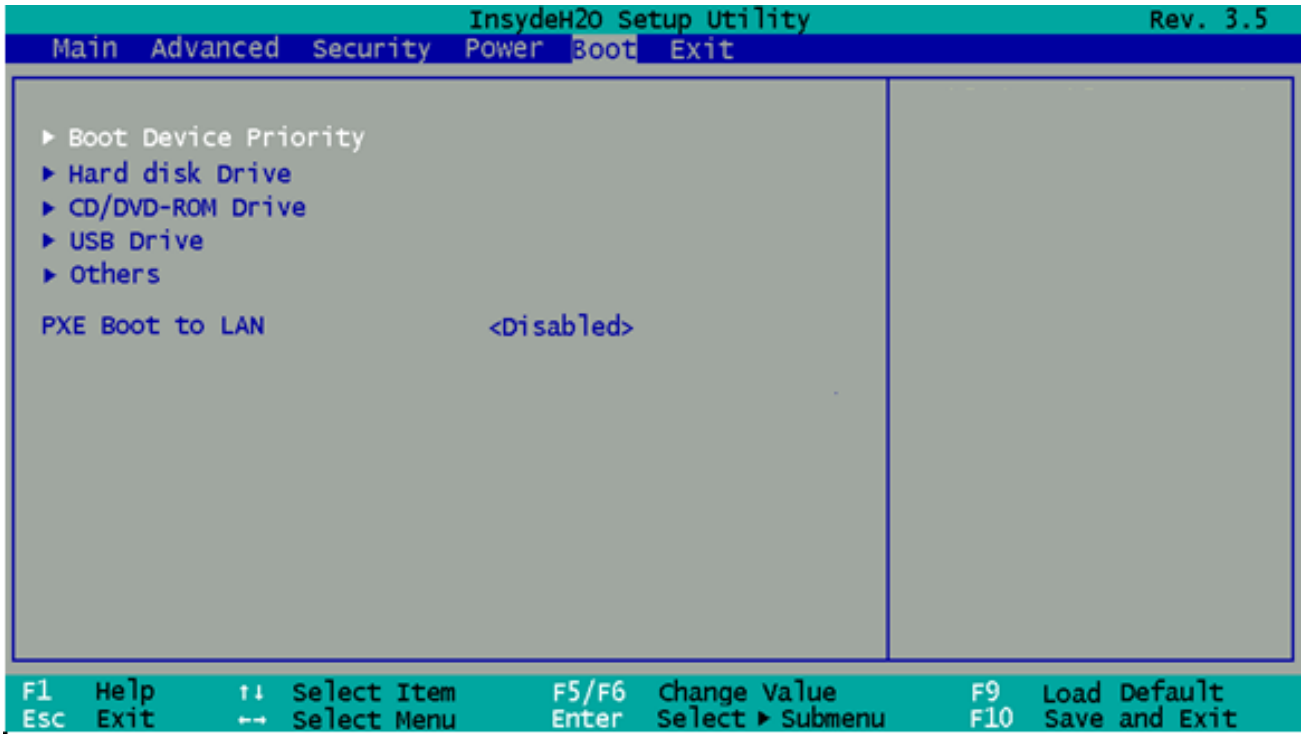
Removing a Password
Follow these steps:

1. Use the ↑ and ↓ keys to highlight the Set Supervisor Password parameter and press the Enter key. The Set Password box appears:


Set SupervisorPassword
Please type in your password
Please type in your new password[
Please confirm your new password[

2. Type the current password in the Enter Current Password field and press Enter.
3. Press Enter twice without typing anything in the Enter New Password and Confirm New Password fields. The computer then sets the Supervisor Password parameter to “Clear”.
4. When you have changed the settings, press u to save the changes and exit the BIOS Setup Utility.

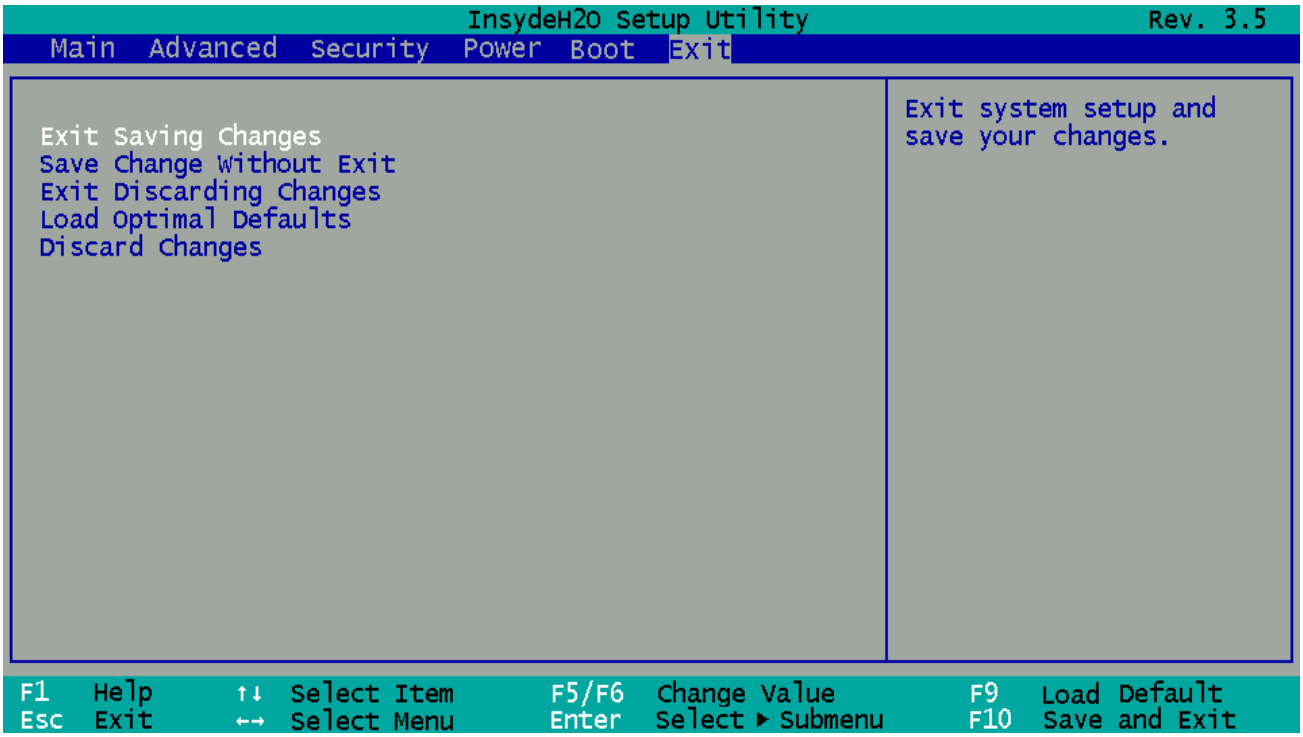
3.4.4 Boot Setup


InsydeH2O Setup Utility Rev. 3.5
Main Advanced Security Power Boot Exit
Boot Device Priority
Hard disk Drive
CD/DVD-ROM Drive
USB Drive
Others
PXE Boot to LAN <Disabled>
F1 Help ↑↓ Select Item F5/F6 Change Value F9 Load Default
Esc Exit ↔ Select Menu Enter Select ▸ Submenu F10 Save and Exit

Note: The control keys are listed at the bottom of the menu. If you need any help with the item fields, you can press the <F1> key, and the relevant information will be displayed.

Item	Option	Description
Boot Device Priority	N/A	Select Boot Devices to select specific devices to support boot. (The item can't display when no device.)
Hard disk Drive	N/A	Show the Hard disk drives. (The item can't display when no device.)
CD/DVD-ROM Drive	N/A	Show the CD/DVD-ROM drives. (The item can't display when no device.)
USB Drive	N/A	Show the USB diskette drives. (The item can't display when no device.)
Other	N/A	Show the other drives. (The item can't display when no device.)
PXE Boot to LAN	Enabled Disabled	Disables or enables PXE boot to LAN.

3.4.5 Exit Setup


InsydeH2O Setup Utility Rev. 3.5
Main Advanced Security Power Boot Exit
Exit Saving Changes
Save Change Without Exit
Exit Discarding Changes
Load Optimal Defaults
Discard Changes
Exit system setup and save your changes.
F1 Help ↑↓ Select Item F5/F6 Change Value F9 Load Default
Esc Exit ↔ Select Menu Enter Select ▶ Submenu F10 Save and Exit

Note: The control keys are listed at the bottom of the menu. If you need any help with the item fields, you can press the <F1> key, and the relevant information will be displayed.

Item	Option	Description
Exit Saving changes	Yes NO	Exit System Setup and save your changes.
Save change without Exit	Yes NO	Save Your changes and without exiting system.
Exit Discarding changes	Yes NO	Exit system setup and without saving your changes.
Load Optimal Defaults	Yes NO	Load default values for all SETUP item.
Discarding changes	Yes NO	Load previous values from CMOS for all SETUP items.

3.5 WATCHDOG, GPIO, AND BYPASS PROGRAMMING

3.5.1 Watchdog Programming

This section describes the usage of WATCHDOG. AR-B6050 integrated the WATCHDOG that enable user to reset the system after a time-out event. User can use a program to enable the WATCHDOG and program the timer in range of 1~255 second(s)/minute(s). Once user enables the WATCHDOG, the timer will start to count down to zero except trigger the timer by user's program continuously. After zeroize the timer (stop triggering), the WATCHDOG will generate a signal to reset the system. It can be used to prevent system crash or hang up. The WATCHDOG is disabled after reset and should be enabled by user's program.

Please refer to the following table to program WATCHDOG properly, and user could test WATCHDOG under 'Debug' program.

Address port: 2E and Data port: 2F	
C:>debug	To enter debug mode.
-o 2E 87 **-o 2E 01** **-o 2E 55** **-o 2E 55**	To enter configuration.
-o 2E 07	To point to Logical Device Number Reg.
-o 2F 07	To select logical device 7 (WATCHDOG).
-o 2E 72 **-o 2F 40**	To select "keyboard reset" as WATCHDOG output to reset system.
-o 2E 72	Preparing to select the unit of timer equals minute or second.
-i 2F	To read the value of index "2F".
-o 2F xx	The value "xx" equals [(value of index "2F") OR (80)]. OR (80): unit is second. OR (00): unit is minute.
-o 2E 73	Preparing to set the WATCHDOG timer value.
-o 2F ##	The value "##" ranges between 01 ~ FF (1 ~ 255 seconds). **00: To disable WATCHDOG.**
-q	To quit debug mode

Notice: The "actual" timer value may not match with the "theoretical". That is because of the tolerance of internal oscillating clock and cannot be adjusted or optimized.

The WATCHDOG sample code of C language as below:

```
//=============================================================================
// Rev    Date          Name    Description
//=============================================================================
// 1.0    12/16/2009    Willy   W83627EHF WatchDog timer test
//=============================================================================
```

```
=======

//=====================================================================
=======
//   Language include files
//=====================================================================
=======
#include <conio.h>
#include <stdlib.h>
#include <stdio.h>
#include <dos.h>

//=====================================================================
=======
//   Normal procedure
//=====================================================================
=======
void Show_Help();

//=====================================================================
=======
//   Main procedure
//=====================================================================
=======
int main(int argc, char *argv[])
{
    unsigned char IO_Port_Address=0x2E;
    unsigned char Time;

    unsigned char Temp;

    if ( argc != 2 )
      {   Show_Help();     return 1;        }

    clrscr();

    Time=atoi(argv[1]);

    // Set Watchdog
    outportb(IO_Port_Address,0x87);      // (EFER) Extended Functions Enable Register
    outportb(IO_Port_Address,0x87);

    outportb(IO_Port_Address,0x2D);      // Point to Global Reg.
                          // Select Multi-Function pin, (Bit0=0 Watchdog Function)
    outportb(IO_Port_Address+1,(inportb(IO_Port_Address+1)&0xFE));

    outportb(IO_Port_Address,0x07);      // Point to Logical Device Number Reg.
    outportb(IO_Port_Address+1,0x08);  // Select logical device 8, (Watchdog Function)

    outportb(IO_Port_Address,0x30);      // Device Active register
    outportb(IO_Port_Address+1,0x01);
```

```
    outportb(IO_Port_Address,0xF5);     // Select Watchdog count mode seconds or
minutes
    outportb(IO_Port_Address+1,0x02);       // Default is second and KBRST mode.

    outportb(IO_Port_Address,0xF6);     // Set Watchdog Timer Value
    outportb(IO_Port_Address+1,Time);  // 0x00 to disable, max 0xFF

    textcolor(YELLOW);
    for(Temp=Time;Temp>0;Temp--)
     {
        outportb(IO_Port_Address,0xF6); // Read Watchdog Timer Value
        Time=inportb(IO_Port_Address+1);

        gotoxy(20,10);
        cprintf(">>> After %3d Second will reset the system. <<<",Time);

        delay(1000);
     }

    textcolor(LIGHTRED);
    gotoxy(18,10);
    cprintf("If you can see this message, Reset system is Fail");

    return 1;
}

//=====================================================================
=======
// Function     : Show_Help()
// Input    : -
// Change       : -
// Return : -
// Description    : Show Help string.
//=====================================================================
=======
void Show_Help()
{
    clrscr();
    printf("WatchDog Test for W83627EHF\n\n");
    printf("Sample:                                 \n");
    printf("              WDT.EXE 10                \n");
    printf("( For 10 seconds to reset. )\n");
}
//=====================================================================
=======
```

3.5.2 GPIO Programming

This section describes the usage of GPIOs. AR-B6050 integrated eight bits, 5V TTL level, bidirectional, and software programmable GPIOs for user's application. They are all capable of 5 mA source current for output and 8 mA sink current for input individually. The electrical characteristics of GPIOs as following table:

PIN	SIGNAL	PIN	SIGNAL
1	GPO0	2	VCC
3	GPO7	4	GPI7
5	GPO2	6	GPI6
7	GPO3	8	GPI5
9	GND	10	GPI4

The GPIO sample code of C language as below:

```
//=============================================================================
=======
// Rev     Date            Name     Description
//=============================================================================
=======
// 1.0     03/17/10 Willy      GPIO10~GPIO17 Test utility for W83627EHF.
//=============================================================================
=======

//=============================================================================
=======
// Turbo C++ Version 3.0 Copyright(c) 1990, 1992 by Borland International,Inc.
//=============================================================================
=======

//=============================================================================
=======
//   Language include files
//=============================================================================
=======
#include <conio.h>
#include <stdio.h>

//=============================================================================
=======
//   Normal procedure
//=============================================================================
=======
void Show_Help();
void Show_Fail();
void Show_Pass();
```

```
//=============================================================================
=======
//   Main procedure
//=============================================================================
=======
int main(int argc)
{
   char *Model_Name="AR-B6050";
   char *Version="v1.0";
   unsigned char  IO_PORT_BASE=0x2E;   // DATA_PORT = IO_PORT_BASE + 1;
   unsigned char data;
   int result=0;

   if ( argc > 1 )
      {   Show_Help();     return 1;   }

   clrscr();
   textcolor(WHITE);
   gotoxy(1, 1);
cprintf("<>=================================================================
=============<>");
   gotoxy(1, 2);   cprintf("|| W83627EHF GPIO Test Utility %s Acrosser Technology Co., Ltd.
||",Version);
   gotoxy(1, 3);
cprintf("<>=================================================================
=============<>");
   gotoxy(1, 4);
cprintf("<>=================================================================
=============<>");
   gotoxy(1, 5);   cprintf("|| Model Name    :
||");
   gotoxy(1, 6);   cprintf("|| SIO IO Base :
||");
   gotoxy(1, 7);
cprintf("<>=================================================================
=============<>");

   // Show Got Parameter Informat
   textcolor(LIGHTGRAY);
   gotoxy(18,5);      cprintf("%s",Model_Name);
   gotoxy(18,6);      cprintf("%X",IO_PORT_BASE);

   // Enter W83627EHF Config
   outportb(IO_PORT_BASE,0x87);
   outportb(IO_PORT_BASE,0x87);

   // Set Multi-function Pins to GPIO
   outportb(IO_PORT_BASE,0x29);
   outportb(IO_PORT_BASE+1,(inportb(IO_PORT_BASE+1) | 0x01));

   // Select GPIO Port device
```

```
outportb(IO_PORT_BASE,0x07);
outportb(IO_PORT_BASE+1,0x07);

// Set GPIO Port Active
outportb(IO_PORT_BASE,0x30);
outportb(IO_PORT_BASE+1,0x01);

// Set GPIO I/O Register to 00h
outportb(IO_PORT_BASE,0xF3);
outportb(IO_PORT_BASE+1,0x00);

// Set W83627EHF GPIO10~13 to Output, GPIO14~GPIO17 to Input
outportb(IO_PORT_BASE,0xF0);
outportb(IO_PORT_BASE+1,0xF0);

// Set W83627EHF GPIO10~13 to High
outportb(IO_PORT_BASE,0xF1);
outportb(IO_PORT_BASE+1,0x0F);
// Read W83627EHF GPIO14~17 Status, if not High error.
data=inportb(IO_PORT_BASE+1)&0xF0;
if(data!=0xF0)
    result=1;
// Set W83627EHF GPIO10~13 to Low
outportb(IO_PORT_BASE,0xF1);
outportb(IO_PORT_BASE+1,0x00);
// Read W83627EHF GPIO14~17 Status, if not Low error.
data=inportb(IO_PORT_BASE+1)&0xF0;
if(data!=0x00)
    result=1;

// Set W83627EHF GPIO10~13 to input, GPIO14~GPIO17 to Output
outportb(IO_PORT_BASE,0xF0);
outportb(IO_PORT_BASE+1,0x0F);

// Set W83627EHF GPIO14~17 to High
outportb(IO_PORT_BASE,0xF1);
outportb(IO_PORT_BASE+1,0xF0);
// Read W83627EHF GPIO10~13 Status, if not High error.
data=inportb(IO_PORT_BASE+1)&0x0F;
if(data!=0x0F)
    result=1;
// Set W83627EHF GPIO14~17 to Low
outportb(IO_PORT_BASE,0xF1);
outportb(IO_PORT_BASE+1,0x00);
// Read W83627EHF GPIO14~17 Status, if not Low error.
data=inportb(IO_PORT_BASE+1)&0x0F;
if(data!=0x00)
    result=1;

// Exit W83627EHF Config
outportb(IO_PORT_BASE,0xAA);
```

```
    if(result)
        Show_Fail();
    else
        Show_Pass();

    return result;
}

//=============================================================================
=======
// Function     : Show_Help()
// Input    : -
// Change       : -
// Return : -
// Description    : Show Title string.
//=============================================================================
=======
void Show_Help()
{
    clrscr();
    printf("GPIO Test utility for W83627EHF\n\n");
    printf("GPIO0 ▯◀迂迂迂苤          ▯ Vcc\n");
    printf("GPIO1 ▯◀迂迂迂銀迂迂┼▯ GPIO7\n");
    printf("GPIO2 ▯◀迂迂苤   迂迂┼▯ GPIO6\n");
    printf("GPIO3 ▯◀迂迂銀迂迂迂┼▯ GPIO5\n");
    printf("GND     ▯            迂迂迂┼▯ GPIO4\n");
}

//=============================================================================
=======
// Function     : Show_Fail()
// Input    : -
// Change       : -
// Return : -
// Description    : Show Fail Message.
//=============================================================================
=======
void Show_Fail()
{
    textcolor(LIGHTRED);
    gotoxy(20,10);     cprintf("  詗詗詗詗   詗詗詗      詗詗     詗          ");
    gotoxy(20,11);     cprintf("  詗           詗   詗       詗      詗          ");
    gotoxy(20,12);     cprintf("  詗詗詗     詗詗詗詗      詗      詗          ");
    gotoxy(20,13);     cprintf("  詗           詗      詗      詗      詗          ");
    gotoxy(20,14);     cprintf("  詗           詗      詗     詗詗     詗詗詗詗");
}

//=============================================================================
=======
```

```
// Function     : Show_Pass()
// Input    : -
// Change       : -
// Return : -
// Description    : Show Pass Message.
//=============================================================================
=======
void Show_Pass()
{
    textcolor(LIGHTGREEN);
    gotoxy(20,10);     cprintf("  訶訶訶訶   訶訶訶   訶訶訶訶訶  訶訶訶訶");
    gotoxy(20,11);     cprintf("  訶      訶   訶   訶   訶          訶          ");
    gotoxy(20,12);     cprintf("  訶訶訶訶訶  訶訶訶訶訶  訶訶訶訶訶  訶訶訶訶");
    gotoxy(20,13);     cprintf("  訶          訶      訶          訶          訶");
    gotoxy(20,14);     cprintf("  訶          訶      訶  訶訶訶訶訶  訶訶訶訶");
}
//=============================================================================
=======
```

3.6 GPIO and Watchdog

3.6.1 Overview

This model provides both a GPIO interface and a Watchdog timer. Users can use the GPIO and Watchdog APIs to configure and to access the GPIO interface and the Watchdog timer. The GPIO has eight ports. Each port can be configured as an input port or an output port. The Watchdog timer can be set to 1~255 seconds. Setting the timer to zero disables the timer. The remaining seconds of the timer to reboot can be read from the timer.

3.6.2 File Description

1. AcroIO.h
   This header file includes API declarations and macros for GPIO and Watchdog.
2. AcroIO.lib, AcroIO.dll
   The libraries which provide access to GPIO and Watchdog functions.

3.7 API List and Descriptions

3.7.1 GPIO

1. **Syntax:**

   Status_t getGpioCapability(uint32_t *pInputs, uint32_t *pOutput)

Description: This function shows the capability of each GPIO port that it is an output port or an input port.

Parameters:
The returned value which is put at *pInput indicates whether the corresponding GPIO ports are input ports or not. For example, say, the value at *pInput is 0x00000005, it indicates that the ports GPIO0 and GPIO2 are both input ports.
The returned value which is put at *pOutput indicates whether the corresponding GPIO ports are output ports or not. For example, say, the value at *pOutput is 0x000000FA, it indicates that the ports GPIO7, GPIO6, GPIO5, GPIO4, GPIO3, GPIO1 are all output ports. If the *pInput shows that a certain GPIO port is an input port and the *pOutput shows that this port is an output port, this means this port can be configured as an input port or an output port by invoking the 'setGpioDirection( )'. If a certain GPIO port is neither an input port nor an output port, this model does not enable this GPIO port.

Return Value: If the function gets the value successfully, it returns STATUS_SUCCESS, any other returned value stands for error.

2. **Syntax:**

   Status_t getGpioDirection(uint32_t Id, uint32_t *pDirection)

Description: Get the current state of GPIO input/output configuration.

Parameters:
The argument 'Id' has two formats of parameters. If 'Id' is 'GPIO_ALL', the returned value at *pDirection shows the state of every GPIO port. A bit '1' at the value of *pDirection stands for an input port. A bit '0' at the value of *pDirection stands for an output port. For example, say, the *pDirection is 0x00000085, this indicates that the ports GPIO7, GPIO2, GPIO0 are input ports. Other GPIO ports (if enabled) are output ports. The other format of the argument 'Id' is that the 'Id' is 'GPIO_ID0' ~ 'GPIO_ID32'. For example, say, 'Id' is GPIO_ID2, the returned value of *pDirection is 0x1(input port) or 0x0(output port).

Code Sample:
Case 1:

```
Status_t status;
uint32_t Direction;

status = getGpioDirection(GPIO_ALL, &Direction);
```

Case 2:

```
Status_t status;
```

```
uint32_t Direction;

status = getGpioDirection(GPIO_ID2, &Direction);
if(Direction == 0x1) {
   cout << “GPIO2 is an Input port” << endl;
} else {
   cout << “GPIO2 is an Output port” << endl;
}
```

Return Value: If the function gets the values successfully, it returns STATUS_SUCCESS, any other returned value stands for error.

3. **Syntax:**

Status_t setGpioDirection(uint32_t Id, uint32_t Direction)

Description: Set the current state of GPIO input/output configuration.

Parameters:
The argument ‘Id’ has two formats of parameters. If ‘Id’ is ‘GPIO_ALL’, the parameter ‘Direction’ is bit patterns to set the input/output configuration of the corresponding GPIO ports. A bit ‘1’ at the value of ‘Direction’ sets the corresponding GPIO port as an input port. A bit ‘0’ at the value of ‘Direction’ sets the corresponding GPIO port as an output port. The other format of the argument ‘Id’ is that the ‘Id’ is ‘GPIO_ID0’ ~ ‘GPIO_ID32’. For example, say, ‘Id’ is GPIO_ID2. If ‘Direction’ is any value other than 0, it configures the port GPIO2 as an input port. If ‘Direction’ is 0, it configures the port GPIO2 as an output port.

Return Value: If the function sets the values successfully, it returns STATUS_SUCCESS, any other returned value stands for error.

4. **Syntax:**

Status_t getGpioLevel(uint32_t Id, uint32_t *pLevel)

Description: Get the current state of the GPIO ports.

Parameters:
The argument ‘Id’ has two formats of parameters. If ‘Id’ is ‘GPIO_ALL’, the returned value at *pLevel shows the state of every GPIO port. A bit ‘1’ at the value of *pLevel stands for a logical high. A bit ‘0’ at the value of *pLevel stands for a logical low. For example, say, the *pLevel is 0x00000085, this indicates that the ports GPIO7, GPIO2, GPIO0 are at the state of logical high. Other GPIO ports (if enabled) are at the state of logical low. The other format of the argument ‘Id’ is that the ‘Id’ is ‘GPIO_ID0’ ~ ‘GPIO_ID32’. For example, say, ‘Id’ is GPIO_ID2, the returned value of *pLevel is 0x1(logical high) or 0x0(logical low).

Return Value: If the function gets the values successfully, it returns STATUS_SUCCESS, any other returned value stands for error.

5. **Syntax:**

Status_t setGpioLevel(uint32_t Id, uint32_t Level)

Description: Set the current state of GPIO ports.

Parameters:
The argument 'Id' has two formats of parameters. If 'Id' is 'GPIO_ALL', the parameter 'Level' is bit patterns to be set to the corresponding GPIO ports. A bit '1' at the value of 'Level' sets the corresponding GPIO port to logical high. A bit '0' at the value of 'Level' sets the corresponding GPIO port to logical low. The setting to an input port is ignored. The other format of the argument 'Id' is that the 'Id' is 'GPIO_ID0' ~ 'GPIO_ID32'. For example, say, 'Id' is GPIO_ID2. If 'Level' is any value other than 0, it sets the port GPIO2 to logical high. If 'Level' is 0, it sets the port GPIO2 to logical low.

Return Value: If the function sets the values successfully, it returns STATUS_SUCCESS, any other returned value stands for error.

3.7.2 Watchdog

1. **Syntax:**
   Status_t getWtdTimer(uint32_t *pTimer)

   Description: This function read the value of the watchdog timer.
   Parameters: The value of the timer is put at the memory which is pointed by the argument 'pTimer'.
   Return Value: This function always returns STATUS_SUCCESS.

2. **Syntax:**
   Status_t setWtdTimer(uint32_t Timer)

   Description: This function sets the watchdog timer register to the value 'Timer' and starts to count down. The value could be 0 ~ 255. The unit is second. Setting the timer register to 0 disables the watchdog function and stops the countdown.
   Parameters: The parameter 'Timer' is the value to be set to watchdog timer register. The range is 0 ~ 255.
   Return Value: This function always returns STATUS_SUCCESS.